

## **Chapter 3K. Economic Conditions and Effects**

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## Chapter 3K. Economic Conditions and Effects

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### SUMMARY

*This chapter discusses the economic effects of the DW project. Following are the types of economic effects that could be associated with implementation of the DW project alternatives:*

- *changes in employment and income resulting from changes in agricultural and recreational uses of the DW project islands;*
- *changes in employment and income resulting from construction, operations, and maintenance activities associated with project implementation; and*
- *changes in fiscal conditions (public revenues and public costs) resulting from project implementation.*

*Because economic effects are not considered environmental impacts under CEQA and NEPA, no conclusions are made in this chapter regarding the significance of these economic effects and no mitigation for economic effects is identified.*

*Under Alternative 1 or 2, the conversion of lands currently farmed on the DW islands would result in adverse effects on agriculture-related employment and income; however, project-related recreation expenditures and project construction, operation, and maintenance activities would generate a net increase in employment and income within the two-county region. The construction and operation of the project also would generate additional property tax revenues within Contra Costa and San Joaquin Counties.*

*Implementing Alternative 3 would have a beneficial effect on the regional economy at buildout of the project. Net employment and income benefits would be greater than those described for Alternatives 1 and 2 because of increased construction, operation, and maintenance employment and expenditures required to expand water storage capabilities to all four DW islands.*

*Implementing the No-Project Alternative would result in increases in local employment and income in the agricultural sector. However, these effects may be short term because of erosion and subsidence problems associated with agricultural production on the islands. No information is available concerning the length of time agriculture will remain physically and economically feasible on the project islands; however, intensified agricultural use of the islands likely will become more costly to maintain over the long term. Recreation on the project islands would increase slightly from existing levels under this alternative because for-fee hunting (day use only) on the four islands would be expanded, which would benefit local economies.*

### INTRODUCTION

Under CEQA and NEPA, economic and social effects alone are not considered environmental impacts; however, under CEQA, economic and social effects can be discussed in an EIR at the option of the lead agency. CEQA (State CEQA Guidelines Section 15131) allows

for economic and social impact discussions in an EIR when the agency is:

- tracing the chain of cause and effect from a project's economic and social effects to physical changes caused by those effects (with the focus of the analysis on the physical changes),

- determining the significance of physical changes caused by a project (e.g., economic or social effects may be used to assess the severity of a project-related physical change), or
- making CEQA findings relating to the feasibility of mitigating project impacts (the economic information must be in the EIR or added to the record in some other manner).

Similarly, NEPA requires discussion of economic impacts to the extent to which they are interrelated with environmental impacts (NEPA regulations, 40 CFR 1508.14).

This chapter's discussion of economic effects of the DW project alternatives has been included in this EIR/EIS to help assess the severity of physical impacts related to the conversion of agricultural land, as discussed in Chapter 3I, "Land Use and Agriculture". The change in agriculture-related employment and income was used with other factors to assess the significance of the project's agricultural land conversion impacts.

For public disclosure purposes, this chapter also discusses economic effects related to the construction, operation, and maintenance of the project's water storage and recreation facilities. Fiscal effects of the project in Contra Costa and San Joaquin Counties are also discussed, as well as the indirect economic effects of the project on adjacent landowners, recreationists, and Delta water users.

The economic effects discussed in this chapter are not considered environmental impacts under CEQA and NEPA. Accordingly, no conclusions are made regarding the significance of economic effects and no mitigation for these effects is required.

The discussion of economic effects in this chapter includes several terms that may not be familiar to all readers. The following are definitions of key terms as they are used in this discussion:

- **Direct employment.** Employment generated in businesses that are part of the DW project (i.e., agriculture; recreational uses; and construction, operations, and maintenance of project facilities).
- **Secondary employment.** Indirect or induced employment, defined as follows:

- **Indirect employment.** Employment generated in businesses supplying goods and services related to DW project operations.

- **Induced employment.** Employment generated as a result of consumer spending by employees who are directly and indirectly affected by DW project operations.

- **Full-time equivalent (FTE) employment.** A unit for measuring employment in terms of number of jobs, where one job equals 40 hours of work per week. The actual number of employee jobs supported by a business may differ based on how total work hours are divided among employees.

- **Final demand.** Sum of all purchases for final use or consumption.

- **Employment multiplier.** The number of jobs associated with a \$1 million change in final demand in a specified industry and a specified region.

- **Income.** The earnings of households associated with a given industry, consisting of employee compensation (salary and wages) and proprietors' earnings (profit and dividends) but excluding proprietor contributions to welfare and pension funds. Income is classified as direct or secondary, as follows:

- **Direct income.** Earnings of households generated in businesses that are part of DW project operations.

- **Secondary income.** Earnings of households generated in businesses supplying goods and services related to DW project operations (indirect income) and generated as a result of spending by employees directly and indirectly affected by DW project operations (induced income).

- **Income multiplier.** The amount of income associated with a dollar change in final demand in a specified industry and a specified region.

- **Direct economic effects.** Changes in the earnings of households generated by DW project operations and changes in fiscal conditions (property and sales tax revenues and public costs) associated with DW project operations.

- **Secondary economic effects.** Changes in the earnings of households and in fiscal conditions (property and sales tax revenues and public costs) associated with changes in businesses supplying goods and services related to DW project operations and with spending by employees directly and indirectly affected by DW project operations.

## ECONOMIC CONDITIONS

This section describes conditions on the DW project islands as they existed in 1987 and 1988 when the environmental permitting process for the DW project was initiated. This section also describes the point of reference (or baseline) under CEQA for measuring the economic changes expected to be caused by the DW project's physical impacts. All dollar amounts in this chapter have been adjusted for inflation to 1993 dollars to allow for comparison with dollar amounts estimated for conditions with the DW project.

As discussed in Chapter 3I, "Land Use and Agriculture", some changes in agricultural land use and related employment and income on the islands have occurred since 1988; however, some of these changes have resulted from project-related actions and influences. (Changes include portions of fallowed lands on Holland and Webb Tracts being brought back into grain production, and some of Bacon Island's asparagus stands being converted to wheat and corn crops.) The 1987-1988 point of reference (with adjustments to 1993 dollars to account for inflation) is used to describe baseline economic conditions because it provides the best basis for comparing project effects on conditions existing at the time of DW's initial application to SWRCB and the Corps.

### Sources of Information

#### Employment

Existing employment generated by agricultural use of the islands was estimated based on the estimated gross value of agricultural production on the islands. Existing direct and secondary employment was estimated by applying employment multipliers provided by the U.S. Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II) (1987) to estimates of production. Modeled estimates rather than actual employment data were used to ensure consistency with employment estimates prepared for the DW project alternatives

and because collecting accurate baseline employment information from numerous landowners and tenant farmers is difficult. All agricultural yield and economic data referred to in this section include data on 1,120 acres on Holland Tract that would not be included in the project under Alternatives 1 and 2, but would be included under Alternative 3.

The effects of interindustry linkages and the impacts induced by household spending were estimated using RIMS multipliers. RIMS multipliers for industrial sectors for the project vicinity were obtained for an area that approximates the economic impacts of production changes on the economy of San Joaquin and Contra Costa Counties.

Existing employment generated by recreational use of the islands was estimated based on the recreational use estimates in Chapter 3J, "Recreation and Visual Resources". These estimates were used with recreation spending profiles to estimate existing spending associated with recreational use of the islands. RIMS employment multipliers for industrial sectors were then used to estimate direct and secondary employment associated with existing levels of spending. All recreation use numbers and economic data referred to in this section exclude the marinas on Holland Tract, which would not be directly affected by the project. The boat slip occupancy rate of Holland Tract's largest marina reportedly averages 85%, with summer months being especially busy (Cochrell pers. comm.). Increased boat traffic generated by the project would likely have minor economic effects on the marinas because occupancy of the marinas is already high.

Overall employment effects of the project were compared to estimates of employment in San Joaquin and Contra Costa Counties provided by the California Employment Development Department.

#### Income

Income generated by existing agricultural use of the four project islands was estimated in much the same way described above for employment. The RIMS income multipliers were applied to estimates of the gross value of agricultural production on the islands to provide estimates of direct and secondary income generated by the islands throughout San Joaquin and Contra Costa Counties. Similarly, income associated with existing recreational uses of the islands was estimated using RIMS income multipliers with estimates of recreation spending.

## **Fiscal Conditions**

Information on property tax revenues generated by the islands was provided by landowners through the project proponent (Williams pers. comm.).

## **Existing Employment**

### **Agriculture**

Agriculture is the primary economic activity on the four project islands, using an estimated 65% of the islands' total acreage in 1987-1988. The average gross value of the agricultural output of the four DW project islands (excluding the output of 1,120 nonproject acres on Holland Tract) is shown in Table 3K-1 (in 1993 dollars). Agricultural operations on the project islands generate three kinds of employment in the local and regional economy. First, direct employment is generated on the project islands through crop-related cultivation and harvesting activities. The expenditures on goods and services related to onsite agricultural operations indirectly generate additional employment in businesses supplying goods and services. Employment is also induced throughout the region as a result of consumer spending by employees who are directly and indirectly affected by onsite agricultural operations. The indirect and induced effects are referred to throughout the remainder of this chapter as the secondary economic effects of the project. RIMS employment multipliers for the crops produced on the project islands are shown in Table 3K-2.

Agricultural use of the four islands generates an estimated 290 FTE direct and secondary jobs in San Joaquin and Contra Costa Counties (Table 3K-2). The majority of these jobs are generated by the agricultural output of Bacon Island. Bacon Island, with its extensive production of labor-intensive vegetable crops, generates an estimated 221 direct and secondary jobs. Webb Tract, Bouldin Island, and Holland Tract, which primarily produce grain crops that require relatively less labor, generate an estimated 8, 34, and 26 direct and secondary jobs, respectively.

### **Recreation**

A small number of jobs are currently generated within San Joaquin and Contra Costa Counties by recreational use of the islands. The primary recreational activities on the project islands are hunting on Bouldin Island and Webb Tract and fishing on Bacon Island. As shown in Table 3K-3 under "Existing Conditions", the

islands generate an estimated 3,852 days of use (visitor days) by recreationists from outside of the two-county area, excluding fishing and boating recreation days on Holland Tract originating from existing marinas that would not be directly affected by the project. (A visitor day is defined as participation by one individual in a recreational activity during any portion of a 24-hour period.)

Employment is generated by the expenditures of visitors in eating and drinking places, lodging places, and retail establishments. The total estimated annual expenditure for nonlocal visitors to the islands is approximately \$119,600 (Table 3K-3). Based on RIMS employment multipliers for the appropriate industrial sectors, it is estimated that current spending generates very little direct and secondary employment (an estimated four jobs) in San Joaquin and Contra Costa Counties because of the small number of nonlocal recreationists visiting the islands (see Table 3K-4 under "Existing Conditions"). RIMS employment multipliers for components of recreation spending are shown in Table 3K-4.

## **Existing Income Generated by Use of the DW Islands**

### **Agriculture**

Together, the four islands produce crops worth an estimated \$11.6 million (1993 dollars), based on market prices (Table 3K-1). In terms of crop value Bacon Island is, by far, the greatest producer. Bacon Island's production of asparagus, potatoes, and wine grapes generates an estimated \$8.2 million annually. Webb Tract, Bouldin Island, and Holland Tract, which produce lower value grain crops, generate average gross crop values of \$0.5 million, \$1.9 million, and \$1.0 million, respectively.

The direct and secondary income generated by the agricultural output of the four islands is shown in Table 3K-2. Together, the islands generate an estimated \$6.7 million in income throughout San Joaquin and Contra Costa Counties. Bacon Island generates an estimated \$5.1 million, or 76%, of this total.

### **Recreation**

Recreational use of the project islands (excluding the commercial marina on Holland Tract that would not be affected by the project) generates a small amount of income within San Joaquin and Contra Costa Counties. Income is currently generated by expenditures on lodg-

ing, food, and retail goods by nonlocal visitors to the project islands. Based on an estimated \$119,600 in local spending and RIMS income multipliers, an estimated \$68,200 (in 1993 dollars) in direct and secondary income is generated in San Joaquin and Contra Costa Counties (Table 3K-4).

### **Existing Fiscal Conditions**

#### **Public Revenues**

Bacon and Bouldin Islands, located in San Joaquin County, and Holland and Webb Tracts, located in Contra Costa County, generate property and sales tax revenues for these two counties and for cities and districts within the two-county area.

Property tax revenues generated by the islands are limited by Williamson Act contracts, which govern 51% of the total project area (99% on Bacon and Bouldin Islands in San Joaquin County and 1% on Webb Tract in Contra Costa County). Williamson Act legislation enables counties and cities to designate agricultural preserves and to offer preferential taxation based on a property's agricultural use value, rather than on market value, effectively reducing the property tax payments required of landowners under Williamson Act contracts.

During the 1987-1988 tax year, landowners on Holland and Webb Tracts made property tax payments totaling approximately \$125,000 (\$158,000 in 1993 dollars), or an average of \$13.50 (\$17.10 in 1993 dollars) per acre. Bacon and Bouldin Islands generated \$137,000 (\$174,000 in 1993 dollars) in property tax revenues, or \$12.30 (\$15.60 in 1993 dollars) per acre, during the same year (Williams pers. comm.). These revenues are allocated to counties and districts in which the islands are located. Counties received from 35% to 40% of each property tax dollar generated by properties in unincorporated areas during the 1987-1988 tax year.

Property taxes generated by the project area have changed little since the 1987-1988 tax year and have actually decreased in dollars adjusted for inflation. Property tax payments on lands on Holland and Webb Tracts within the project area totaled approximately \$127,000 (\$14.94 per acre) on an assessed value of \$11.8 million during the 1993-1994 tax year. Property tax payments for properties on Bacon and Bouldin Islands totaled \$139,000 (\$13.79 per acre) on an assessed value of \$11.0 million. Property taxes paid on lands within the project area averaged approximately 1.2% of assessed

value during the 1993-1994 tax year. (Forkel pers. comm.)

Agricultural operations on the islands generate sales tax revenues through the purchase of such production inputs as fertilizer, pesticides, herbicides, fuel, and equipment in the local area. Purchases are spread throughout the region, including the communities of Rio Vista, Brentwood, Lodi, and Stockton. These communities receive sales tax revenues equaling 1% of the purchase price of goods purchased within their communities. Based on the value of agricultural production on the islands, it is estimated that annual sales tax revenues generated by purchases in local areas probably would not exceed \$25,000 (assuming that local retail purchases equal 20% of gross production value). Retail spending generated by direct and secondary employment associated with agricultural production on the islands could generate an additional \$15,000 in local sales tax revenues.

#### **Public Costs**

Levee maintenance activities by the local reclamation districts are the most substantial public cost on the DW project islands; they are discussed in Chapter 3D, "Flood Control". Otherwise, the project islands currently require few public services and therefore generate relatively minor costs to the counties and districts serving the project islands, with the exception of mosquito abatement costs. The primary public services currently required by the project islands include police and fire protection services and county road maintenance services. The islands are sparsely populated, have few structures, and generate few calls for fire department or sheriff services. Road maintenance costs to the counties are minor because all roads, with the exception of Bacon Island Road on Bacon Island, are privately maintained.

As described in Chapter 3N, "Mosquitos and Public Health", Bouldin Island and Holland Tract annually generate numerous service calls for the San Joaquin County Mosquito Abatement District and the Contra Costa Mosquito Abatement District, respectively. Mosquito problems on Bouldin Island are generally related to the flooding of cornfields and the proximity of human activities associated with nearby marinas, campgrounds, and urban developments. Mosquito problems on Holland Tract are related to portions of the island outside the project area. No significant mosquito abatement problems are currently generated by Bacon Island and Webb Tract.

An additional but highly variable public cost at the federal level is related to commodity crop deficiency

payments and set-aside programs. Payments to farmers under federal subsidy programs vary from year to year, depending on federally determined crop target prices, national average prices, and qualifying crops. Wheat and corn both qualified as subsidized crops in 1987, generating commodity crop deficiency payments for growers of the crops on the project islands. In 1988, these crops accounted for 50% of the acreage on the four project islands (Table 3I-5) and almost 8% of the wheat and corn acreage harvested in Contra Costa and San Joaquin Counties in 1987 (Table 3I-9 in Chapter 3I, "Land Use and Agriculture"). Information concerning the amount of payments made to farmers on the DW project islands in 1987 is not readily available.

Government payments to farmers in Contra Costa County under all programs totaled \$299,000 (\$380,000 in 1993 dollars) during 1987. These payments averaged \$6,600 per farm (\$8,400 in 1993 dollars) over the 45 farms in the county that received government payments. Payments to farms in San Joaquin County totaled approximately \$7.6 million (\$9.7 million in 1993 dollars) during 1987, averaging \$27,000 (\$34,000 in 1993 dollars) over the 284 farms in San Joaquin County receiving payments in 1987. (U.S. Bureau of the Census 1989.)

## **METHODOLOGY FOR ASSESSMENT OF ECONOMIC EFFECTS**

### **Analytical Approach**

The economic analysis focuses on the direct and secondary economic changes that would occur in the region as a result of implementation of the DW project. For this analysis, the region is defined as a two-county area consisting of San Joaquin and Contra Costa Counties. The analysis uses two measures of economic activity, employment and income, to characterize the economic changes generated by the DW project alternatives.

As discussed at the beginning of this chapter, economic effects of projects are not normally considered impacts on the physical environment and therefore are not considered significant impacts and do not require mitigation under CEQA and NEPA. Because economic effects are not considered environmental impacts, no criteria for determining the significance of economic effects have been included in this chapter. Economic effects, however, can be used to judge the significance of physical impacts. For this analysis, the magnitude and severity of economic effects resulting from project implementation

were identified and used to help characterize the socioeconomic effects resulting from the conversion of agricultural lands to water storage and recreation facilities.

The secondary, offsite economic effects that would be generated by the supply and sale of water stored on the four islands were not evaluated as part of this analysis because it is too remote and speculative to identify the ultimate uses and users of DW project water. Additionally, accurately identifying the price and availability of alternative water supplies for the ultimate users of DW project water is not possible. Without this information, accurately estimating the secondary, offsite economic effects of the supply and sale of DW project water is not possible. Gross revenue generated for the project proponents by the sale of water was estimated based on DW's estimate of the market value of project water and on the expected yield of the project alternatives. Estimates of gross revenues generated by water sales have been included for informational purposes only. These estimates do not necessarily represent the economic value of project water to end users of the water.

Following are brief descriptions of the methodologies used to project the economic effects of the DW project alternatives. All dollar figures in this chapter have been adjusted to 1993 dollars.

### **Effects on Agricultural Employment and Income**

Employment and income effects generated by the loss of agricultural use of the project islands under the DW project alternatives were evaluated based on the existing (1987-1988) cropping patterns and agricultural production described in Chapter 3I, "Land Use and Agriculture". The gross value of each island's agricultural production was estimated using average prices in San Joaquin County over a 5-year period (1988-1992) for each crop currently produced on the DW project islands (Table 3K-1). For some crops, prices were modified based on information provided by farmers on the islands. Crop prices fluctuate, sometimes dramatically, from year to year because of local, national, and international market and weather conditions. A 5-year price average was used to smooth out price levels that may have fluctuated dramatically. Employment and income multipliers from the RIMS model were used to project total direct and secondary employment and income generated within San Joaquin and Contra Costa Counties by current agricultural production on the DW project islands (Table 3K-2).

This analysis is based on the assumption that the existing agricultural production on the four DW islands

could continue indefinitely. In fact, most soils on the four islands are limited by long-term subsidence and erosion hazards, according to NRCS (formerly SCS) (Table 3I-3). Continued subsidence of the island bottoms and increased likelihood of levee failure could eventually make agricultural production on these islands infeasible (DWR 1990). (See Chapter 3D, "Flood Control", and Chapter 3I, "Land Use and Agriculture".) This analysis also assumed that the mix of crops grown on the DW project islands in 1987 would continue in the future. Subsidence, levee maintenance costs, and market factors could substantially affect future crop mixes (although they have not affected crop mixes between 1987 and 1994).

### **Effects on Recreation-Related Employment and Income**

Estimates of employment and income effects generated by recreation were largely based on the changes in recreational use of the DW project islands under each of the project alternatives projected in Chapter 3J, "Recreation and Visual Resources". Analysis of the economic effects of changes in recreation visitation associated with the DW project alternatives focused on changes in final demand for recreation goods and services. The analysis evaluated effects resulting from changes in hunting, boating, and other recreational uses of the DW project islands (refer to Chapter 3J).

The approach used to assess changes in final recreation demands involved the following steps:

1. Estimate the number of recreation-related visitor days on the islands under existing conditions and the DW project alternatives (refer to Chapter 3J).
2. Estimate the proportion of total recreation use accounted for by nonlocal visitors (i.e., visitors from counties other than San Joaquin and Contra Costa Counties). Recreation expenditures by nonlocals represent exports from the two-county region and hence sales to final demand. Conversely, expenditures by locals do not directly affect sales to final demand because the expenditures would go to other sectors within the regional economy if not spent on recreation goods and services; however, substitution of recreation days from other areas in the region was assumed not to occur under the DW project because of the unique nature of the "recreation package" offered by the DW project. The onsite lodging facilities and marinas, year-round recreation opportunities, and club mem-

bership cost would all differentiate the project-related recreation from other recreation opportunities within the region. These factors would limit the amount of recreation substitution that would occur under the DW project.

3. Estimate recreation expenditures per day by nonlocal visitors to the islands.
4. Aggregate annual changes in final demand for recreational goods and services in the region into three industrial classes: eating and drinking places, lodging establishments, and retail trade.

Expenditures by visitors to the DW project islands were estimated based on studies of daily spending by recreationists in California (USFWS and U.S. Bureau of the Census 1993) and nationwide (Propst et al. 1992), updated to 1993 dollars, weighted for the types of recreation expected on the DW project islands under project operations, and revised for application to the industrial classes identified above in step 4. Visitors who would use the islands under the DW project alternatives were assumed to be club members with access to clubhouse facilities who thus would not spend money on local lodging.

Changes in visitation associated with each project alternative were estimated based on information presented in Chapter 3J, "Recreation and Visual Resources". Proportions of visitors to each island from counties outside the region were estimated based on information provided by island landowners concerning the residence of current visitors. As discussed in Chapter 3J (refer to "Existing Recreation Use on the DW Project Islands"), approximately 80% of hunters visiting the islands under the DW project alternatives were assumed to be visitors to the two-county region.

Expenditures considered in this analysis include grocery purchases, restaurant and lodging expenditures (for existing and no-project conditions), purchases of miscellaneous retail goods, expenditures on miscellaneous recreation services, and gasoline expenditures. These expenditures were aggregated into three industrial classes: eating and drinking places (grocery and restaurant purchases), lodging establishments, and retail trade (miscellaneous retail and gasoline expenditures). The estimates of expenditures made within each industrial class were used in conjunction with the RIMS employment and income multipliers for each industrial class to estimate the total direct and secondary employment and income generated by the project alternatives. The employment and income generated by expenditures on onsite



club memberships were implicitly included in the projections of operations- and maintenance-related employment and income.

### **Employment and Income Effects of Project Construction, Operations, and Maintenance**

Employment and income effects generated by the construction, operation, and maintenance of the water storage and recreation facilities were evaluated based on projections of direct employment requirements provided by DW (Forkel pers. comm.). Total direct and secondary regional employment effects for each project-related activity, including employment related to the operation and maintenance of recreation facilities, were projected based on the relationship of direct employment to secondary employment suggested by the appropriate RIMS employment multipliers. Total direct and secondary income was then projected based on the RIMS relationship of total employment to total income for the appropriate industrial sectors.

### **Fiscal Effects**

Fiscal effects were evaluated based on projections of construction and operations and maintenance expenditures provided by DW (Forkel pers. comm.). Order-of-magnitude estimates of property and sales tax revenue generated by project operations were compared with estimates of existing revenues to evaluate changes in public revenues generated by the project. Public costs for local governments potentially generated by the project were qualitatively evaluated.

## **ECONOMIC EFFECTS OF ALTERNATIVE 1**

### **Employment Effects**

#### **Agriculture**

Implementation of Alternative 1 would preempt existing agricultural operations on the four project islands, resulting in the loss of an estimated 280 direct and secondary jobs in San Joaquin and Contra Costa Counties. (An estimated nine jobs would continue to be generated by agricultural use of 1,120 acres on Holland Tract excluded from the project under Alternatives 1 and 2.) Although some agricultural use may be incidental to the management of the habitat islands, the employment

generated by agricultural use would be relatively small and would be included in employment projections for project operations. The loss of employment generated by the agricultural use of Bacon Island would represent the largest loss among the four islands; agricultural operations on Bacon Island currently generate an estimated 221 direct and secondary jobs, or 76% of all jobs generated by agricultural use of the DW project islands (Table 3K-2). Employment groups sustaining the most severe job losses would include onsite farmworkers and employees who work for local suppliers of agricultural goods (e.g., farm equipment, seed, fertilizers, pesticides, gasoline) and services. The loss of agricultural employment would probably occur within 3 years of necessary project permits being granted.

### **Recreation**

Based on the projections of recreation-related expenditures shown in Table 3K-3 and the RIMS employment multipliers shown in Table 3K-4, it is estimated that implementation of Alternative 1 would generate approximately 91 secondary jobs within San Joaquin and Contra Costa Counties at buildout of the project's recreation facilities. This total excludes recreation-related employment on the project islands that is included under "Project Construction, Operations, and Maintenance" below.

### **Project Construction, Operations, and Maintenance**

Implementation of Alternative 1 would directly generate temporary, construction-related employment and permanent, operations-related employment. Both types of employment would generate secondary employment within San Joaquin and Contra Costa Counties.

Temporary employment would be generated by earthwork and levee improvements and other related improvements required for the water storage operations. Temporary employment would also be generated by the construction of onsite hunting and recreation facilities. Employment related to the construction of the water storage facilities would probably occur over a 1.5-year period following the granting of necessary project permits. Employment related to the construction of recreation-related facilities would probably occur over a longer period as facilities are constructed to meet the demand for onsite recreation pursuant to the limitations of the permit conditions imposed by the lead agencies and of the HMP (refer to Appendix G3, "Habitat Management Plan for the Delta Wetlands Habitat Islands"). DW expects buildout of all recreation facilities within 20 years (Forkel pers. comm.); this rate of development was used

to estimate annual employment and income generated by construction of recreation-related facilities.

According to estimates provided by DW, construction of water storage facilities would directly generate 309 person-years of construction employment, or 206 FTE jobs spread over 1.5 years. Person-years of construction employment represent the number of years of full-time employment generated by construction activities; FTE employment represents the number of permanent, full-time jobs generated by the ongoing operations of the DW project. Construction of recreation facilities would directly generate an estimated 420 person-years of employment, or an average of 22 FTE jobs over the 20-year construction period.

Total direct and secondary employment generated by the construction activities was projected using RIMS employment multipliers (Table 3K-5). Total direct and secondary temporary employment generated by Alternative 1 within San Joaquin and Contra Costa Counties was projected to total 344 FTE jobs over the 1.5-year construction period for water storage facilities and an average of 37 FTE jobs annually over the 20-year construction period for recreation facilities.

Based on DW estimates, operations and maintenance of the water storage and recreation facilities would directly generate a total of 155 permanent FTE jobs. Approximately 75 of these jobs would be related to the annual operations and maintenance of the water storage facilities (i.e., 34 employees for the maintenance of facilities and equipment and 41 employees for levee and island maintenance activities), while the remainder would be related to operation and maintenance of the recreation facilities.

A projected 315 permanent direct and secondary jobs would be generated by operations and maintenance of Alternative 1 (Table 3K-5). These jobs would be generated over the buildout period beginning with the operation of the water storage facilities, reaching a maximum, permanent level at buildout of the recreation facilities. The employment total includes a projected 13 secondary jobs in the regional economy that would be generated by annual expenditures for major maintenance of recreation facilities.

### **Net Employment Effects**

Table 3K-5 presents a summary of the employment effects under Alternative 1. A projected 406 permanent jobs (excluding the nine agriculture-related jobs generated by the continued agricultural use of 1,120 acres on Holland Tract) would be generated within the region with

the expenditures of project-related recreationists and the operation and maintenance of water storage and recreation facilities. This gain in employment would offset the loss of an estimated 284 jobs currently generated by on-site agricultural operations and recreation-related activities. Implementation of Alternative 1 would result in the projected net gain of 122 permanent FTE jobs in San Joaquin and Contra Costa Counties at full buildout and operation of onsite recreation facilities. Project-related job losses would occur primarily in agriculture-dependent industries, while job gains would occur in levee maintenance, equipment maintenance, and recreation-dependent industries.

The regional economy would also benefit from temporary employment in the construction industry and subsequent construction-related spending in the regional economy. Implementation of Alternative 1 would generate a projected 344 direct and secondary FTE jobs over the 1.5-year water project construction period. An additional 37 FTE jobs would be generated annually over the 20-year recreation facility construction period.

### **Income Effects**

#### **Agriculture**

Implementation of Alternative 1 would result in the loss of existing agricultural production and the subsequent loss of income generated by the agricultural production on the four project islands. (Nonproject areas on Holland Tract would remain in agricultural production and would continue to produce agricultural income.) As discussed in the "Affected Environment" section, the islands currently produce an estimated \$11.6 million in agricultural output, generating an estimated \$6.7 million in direct and secondary income in San Joaquin and Contra Costa Counties (Table 3K-2). All agricultural income other than the estimated \$217,600 generated by the continued agricultural use of 1,120 acres on Holland Tract would be lost as a result of implementation of Alternative 1.

#### **Recreation**

The spending of recreationists visiting the project islands under Alternative 1 would generate new income in San Joaquin and Contra Costa Counties. Nonlocal visitors to the DW project islands are projected to spend approximately \$3.1 million annually in the two-county area at buildout of the onsite recreation facilities (Table 3K-3). Based on the RIMS income multipliers shown in

Table 3K-4, this spending would generate approximately \$1.8 million in direct and secondary income in San Joaquin and Contra Costa Counties.

### **Project Construction, Operations, and Maintenance**

Alternative 1 would generate income in San Joaquin and Contra Costa Counties during both the construction and operation phases of the project. The construction of the water storage and recreation facilities would generate income through wages paid to construction workers and the earnings of contractors. The purchase of construction inputs and the subsequent spending by workers and contractors would generate secondary income in the regional economy. RIMS income multipliers were used to project total income generated by project construction.

The analysis summarized in Table 3K-6 estimates that approximately \$14.3 million in income would be generated annually by construction activities on the four DW project islands over the expected 1.5-year water storage construction period. Additionally, construction of recreation facilities is projected to generate \$1.5 million in income annually over the 20-year construction period. The island-by-island generation of construction-related direct and secondary income is presented in Table 3K-6.

The operation and maintenance of the water storage and recreation facilities would generate annual income through payments to employees, management earnings, contractor payments, and subsequent household and business expenditures in the regional economy. RIMS income multipliers were used to project total income generated by the operation and maintenance of Alternative 1. Approximately \$11.4 million in direct and secondary income would be generated annually in San Joaquin and Contra Costa Counties by the operation and maintenance of Alternative 1 (Table 3K-6). This income would be generated over the buildout period, beginning with the operation of the water storage facilities and reaching a permanent, maximum level at the projected buildout date for the recreation facilities.

The operation of Alternative 1 would also generate revenue through the sale of water. This revenue would be received by DW, which is located in Contra Costa County. A portion of this revenue would be spent in the local area on operation and maintenance of water storage facilities, as discussed above. A portion of this revenue may also be returned to the local economy through other expenditures and taxes. Although there is no way to estimate the price DW will ultimately receive for its water, DW expects to receive \$200-\$250 per acre-foot of delivered water (Forkel pers. comm.). Based on this

price and a projected average annual yield of 222 TAF of water (refer to Appendix A3, "DeltaSOS Simulations of the Delta Wetlands Project Alternatives"), it is estimated that \$44-\$55 million in gross revenues would be generated annually by water sales.

### **Net Income Effects**

A projected \$13.3 million in annual, permanent income (excluding the estimated \$217,600 in income generated by the continued agricultural use of 1,120 acres on Holland Tract) would be generated in the region by the spending of project-related recreationists and the operation and maintenance of water storage and recreation facilities (Table 3K-6). This gain in income would offset the loss of an estimated \$6.5 million in income currently generated by onsite agricultural operations and recreation-related activities. Implementation of Alternative 1 would thus result in the projected net gain of approximately \$6.8 million in annual income in San Joaquin and Contra Costa Counties. The loss in annual income to workers in agriculture-related and other industries in the two-county area would be adverse; however, workers in construction, equipment maintenance, and recreational retail and service industries would benefit from the generation of income under Alternative 1.

The beneficial regional economic effect of the gain in permanent, annual income would be enhanced by the generation of substantial temporary, construction-related income within the region. The construction of water storage facilities would generate a projected annual \$14.3 million in direct and secondary regional income over the expected 1.5-year construction period. Additionally, construction of recreation facilities would generate annual regional income of \$1.5 million over the expected 20-year construction period.

### **Fiscal Effects**

#### **Public Revenue Effect**

As discussed in the "Affected Environment" section, the DW project islands currently generate property tax and sales tax revenues for San Joaquin and Contra Costa Counties and nearby communities and districts. Under Alternative 1, property tax revenues generated by the four islands would increase. Most of the project site is currently under Williamson Act contracts and is taxed based on its agricultural production value. Under Alternative 1, the Williamson Act contracts would remain in effect, but

the appraised values of the project properties would no longer be based on their agricultural production value.

The construction of water storage and recreation facilities would constitute new construction to the land and trigger a reappraisal of the properties. The appraised value of the land, with improvements, would be based on either the construction cost of the project or the potential income stream generated by the project (Miller pers. comm.). Either appraisal method would generate property values above current values, generating greater property tax revenue for the counties and districts in which the islands are located. Property tax revenue would also increase if properties are not kept in their Williamson Act status because the assessed values of properties would approximate their new market values with project facilities.

Based on DW's estimated cost for construction of water storage and recreation facilities (Forkel pers. comm.), the assessed value of the project area could increase from \$22.8 million to approximately \$158 million. Property tax revenue generated by use of the islands could increase from an estimated \$266,000 to a projected \$1.9 million. This revenue would be allocated among Contra Costa and San Joaquin Counties and a number of special districts.

Sales tax revenue generated by use of the islands would likely increase under Alternative 1 because of the increase in regional income associated with project-related employment and expenditures. Under Alternative 1, the loss of retail sales tax revenue generated by purchases of agricultural supplies and expenditures by agricultural workers would be at least partially offset by the purchase of seed and fertilizer for the onsite wildlife habitat plantings; purchases of materials and supplies for project operations and maintenance; and purchases of food, fuel, and other retail goods by recreationists and onsite workers.

#### **Public Cost Effect**

Public costs for levee maintenance on the DW project islands would be substantially reduced under Alternative 1 because DW would be directly paying for levee maintenance on the project islands (see Chapter 3D, "Flood Control"). Other than levee maintenance, few public services, except mosquito abatement services, are currently required by the four DW project islands. Under Alternative 1, no additional public services would be required, with the exception of potential increases in mosquito abatement costs. As discussed in Chapter 3N, "Mosquitos and Public Health", mosquito abatement

problems may increase on the four DW project islands because of increased mosquito habitat. The potential increase in service calls for the two mosquito abatement districts serving the islands is difficult to predict because of the many variables that could affect the need for abatement treatments (i.e., future urban uses on or near the islands, climatic conditions, or annual water management on the islands). The mitigation measures described in Chapter 3N would help reduce potential costs to the San Joaquin County and Contra Costa County Mosquito Abatement Districts.

The recreational use of the islands could generate a slightly greater number of sheriff calls and may require increased maintenance of county roads leading to the islands. The net effect of Alternative 1 on road maintenance costs is not clear. Wear and tear on roads caused by recreationists visiting the islands may actually be less than wear currently being caused by heavy agricultural vehicles (see Chapter 3L, "Traffic"). Increased costs to the counties and other public service providers currently serving the islands should be minimal.

#### **Net Fiscal Effects**

The net fiscal effect of Alternative 1 would likely be beneficial. This conclusion is based on the following considerations:

- increased public revenue would be generated by higher assessed valuations on the DW project islands,
- public levee maintenance costs may be substantially reduced because DW would be providing levee maintenance for the project islands,
- other public costs would be minimal, and
- costs of federal commodity crop deficiency payments would be eliminated.

#### **Indirect Effects**

##### **Indirect Offsite Effects on Recreation**

The availability of recreation opportunities on the DW project islands could indirectly affect the recreational use of other sites in the region through the redistribution of Delta waterfowl populations and hunters. These issues were evaluated in Chapter 3J, "Recreation and Visual

Resources", which states that the offsite effects on waterfowl hunting would be less than significant. Thus, Alternative 1 is not expected to result in adverse indirect, off-site economic effects on operators of other Delta recreational facilities.

#### **Indirect Effects on Adjacent Landowners**

Seepage onto adjacent islands caused by the storage of water on the DW project islands could decrease property values and increase pumping costs for landowners on adjacent islands; however, project-related seepage would be controlled and should not result in increased costs or lower property values for adjacent landowners. This issue is addressed in Chapter 3D, "Flood Control", and Appendix D2, "Levee Design and Maintenance Measures".

#### **Summary of Economic Effects of Alternative 1**

Based on the analysis presented above, Alternative 1 would be expected to have a beneficial effect on the regional economy at buildout of the project. The conversion of lands currently farmed on the DW islands would result in adverse effects on agriculture-related employment and income; however, project-related recreation expenditures and project construction, operation, and maintenance activities would generate a net increase in employment and income within the two-county region. The construction and operation of the project would also generate additional property tax revenues within Contra Costa and San Joaquin Counties.

#### **ECONOMIC EFFECTS OF ALTERNATIVE 2**

The effects of Alternative 2 on regional employment, income, and fiscal conditions would be virtually the same as the effects described for Alternative 1, as summarized in Tables 3K-5 and 3K-6. Regional economic effects would be beneficial under Alternative 2, although farmworkers and agriculture-dependent industries would be adversely affected under this alternative.

Under Alternative 2, revenue generated for DW by the sale of project water would be higher than under Alternative 1. Based on the projected annual yield of 225 TAF of water and DW's estimated water market prices of \$200-\$250 per acre-foot, revenue generated by water

sales would range from \$45 million to \$56 million under Alternative 2.

#### **ECONOMIC EFFECTS OF ALTERNATIVE 3**

Under Alternative 3, net economic effects would be similar to, but generally greater than, effects under Alternative 1 because of increased recreation use and spending and increased construction, operation, and maintenance employment and expenditures required to expand water storage capabilities to all four DW islands. Effects on agriculture-related employment and income would be greater than under Alternatives 1 and 2 because 1,120 acres of agricultural land on Holland Tract, excluded from the project under Alternatives 1 and 2, would be converted to water storage uses under Alternative 3.

#### **Employment Effects**

As shown in Table 3K-5, agriculture-related employment would be reduced by an estimated nine additional jobs relative to Alternative 1 because of the conversion of an additional 1,120 acres of agricultural land on Holland Tract. Recreation-related employment would increase by approximately one FTE job compared with employment under Alternatives 1 and 2. Operation and maintenance of water storage and recreation facilities under Alternative 3 would generate a projected 36 more direct and secondary jobs than would be generated by operation and maintenance activities under Alternative 1.

Under Alternative 3, construction of water storage facilities would generate a projected 732 direct and secondary FTE jobs over the 1.5- to 2.5-year construction period, compared with 344 FTE jobs under Alternatives 1 and 2. Employment generated by construction of recreation facilities would be slightly less than employment generated under Alternatives 1 and 2 if all recreation facilities planned under Alternative 3 are constructed.

#### **Income Effects**

Regional income generated by recreation spending and construction, operation, and maintenance of water storage facilities would be greater under Alternative 3 than under Alternative 1, more than offsetting reduced agriculture-related income. Regional income associated

with operation and maintenance of water storage and recreation facilities would total approximately \$1.1 million more than under Alternative 1. Regional income generated by construction of water storage facilities under Alternative 3 would total approximately \$16.1 million more than under Alternative 1 (Table 3K-6).

Because water storage would be increased under Alternative 3, revenue generated for DW by sales of project water would increase under this alternative. Based on an average annual yield of 356 TAF of delivered water and water prices of \$200-\$250 per acre-foot, annual revenue from water sales would range from \$71 million to \$89 million, compared with \$44-\$55 million under Alternative 1.

#### **Fiscal Effects**

Under Alternative 3, higher project construction costs would generate a higher assessed value and increased property tax revenue for local agencies. Based on DW's estimated construction cost for this alternative, Alternative 3 would generate \$3.6 million in property tax payments at buildout of all facilities, compared with a projected \$1.9 million in property tax revenue under Alternative 1.

Public costs generated by Alternative 3 would likely be similar to those described for Alternative 1.

#### **Indirect Effects**

The potential indirect effects of Alternative 3 on adjacent landowners and other waterfowl clubs in the Delta region would be similar to those described for Alternative 1.

Under Alternative 3, DW would likely be required to mitigate habitat losses on project islands by leasing or purchasing offsite lands for habitat creation or protection. This offsite mitigation could result in the conversion of an unknown amount of agricultural land, resulting in additional agricultural economic effects.

#### **Summary of Economic Effects of Alternative 3**

Alternative 3 would have a beneficial effect on the regional economy at buildout of the project. Net employ-

ment and income benefits would be greater than those described for Alternative 1. As under Alternative 1, the conversion of lands currently farmed on the DW islands, and the potential conversion of offsite agricultural lands, would result in adverse effects on agriculture-related employment and income; however, project-related recreation expenditures and project construction, operation, and maintenance activities would generate a net increase in employment and income within the two-county region. The construction and operation of the project would also generate additional property tax revenue within Contra Costa and San Joaquin Counties.

#### **ECONOMIC EFFECTS OF THE NO-PROJECT ALTERNATIVE**

Employment and income impacts generated by intensified agricultural use of the project islands under the No-Project Alternative were evaluated based on the cropping patterns and agricultural production projections described in Chapter 3I, "Land Use and Agriculture". The methodology used to evaluate direct and secondary economic effects associated with agricultural use of the DW islands was similar to the methodology used to determine existing employment and income.

The methodology used to evaluate recreation-related employment and income changes under the No-Project Alternative was identical to the methodology used for the evaluation of Alternative 1. The recreational usage of the project islands would increase from existing levels because of the expansion of for-fee hunting (day use only) to the four islands (refer to Chapter 3J, "Recreation and Visual Resources").

The economic effects resulting from the intensified agricultural use of the project islands should be considered short-term effects because of erosion and subsidence problems associated with agricultural production on the islands described in Chapter 3I, "Land Use and Agriculture". Over the long term, continued agricultural use of the DW islands may be infeasible because of increased costs of soil management and levee maintenance. (No information is available concerning the length of time agriculture will remain physically and economically feasible on the project islands; however, intensified agricultural use of the islands will likely increase existing erosion and subsidence problems.)

## Employment Effects

As described in Chapter 3I, "Land Use and Agriculture", implementation of the No-Project Alternative would result in more land being brought into production on all islands, generating increased production of vegetable crops on Bacon and Bouldin Islands and grain crops on Holland and Webb Tracts (Table 3K-7). The increased production would require additional labor inputs, which in turn would increase the total direct and secondary employment generated by agricultural use of the islands.

Agricultural production under the No-Project Alternative would generate a projected 828 direct and secondary jobs in San Joaquin and Contra Costa Counties, representing an almost 200% increase over existing island-related agricultural employment (Table 3K-8). Approximately 91% of total direct and secondary employment would be generated by the agricultural output of Bacon and Bouldin Islands.

Under the No-Project Alternative, recreational use of the project island by nonlocal recreationists would increase from an estimated existing 3,852 visitor days to a projected 13,455 visitor use-days (refer to Chapter 3J, "Recreation and Visual Resources", for a description of recreational use effects), generating increased visitor expenditures within the region by a projected \$372,300 (Table 3K-3). This increase in visitor expenditures would increase direct and secondary employment currently generated by the recreational use of the project islands from approximately four to 15 FTE jobs (Table 3K-4).

A projected 843 permanent direct and secondary jobs would be generated within the region under the No-Project Alternative (Table 3K-5). This projected employment level represents a net increase of 550 regional jobs over the estimated existing level of employment generated by use of the islands. The net increase in regional employment under the No-Project Alternative is considered a beneficial economic effect.

## Income Effects

Under the No-Project Alternative, the value of the agricultural output generated by the islands and the resulting income would increase substantially over existing levels. The gross value of the agricultural output of the four islands would increase from an existing \$11.6 million to a projected \$31.1 million under the No-Project

Alternative (Table 3K-7). The projected increase in production on Bouldin Island would account for a large percentage of the overall increase. The average gross value of Bouldin Island's output would increase from an existing \$1.9 million to a projected \$13.4 million as production shifts from grain crops to vegetable crops.

The direct and secondary income generated within San Joaquin and Contra Costa Counties by the agricultural output of the four islands would increase from an existing \$6.7 million to a projected \$19.1 million under the No-Project Alternative (Table 3K-8). Production on Bacon and Bouldin Islands would generate approximately 91% of total income under this alternative.

Under the No-Project Alternative, the increase in recreational spending would lead to a slight increase in the regional income generated by the recreational use of the project islands. Direct and secondary income generated by the expenditures of visitors to the islands would increase from an estimated \$68,000 to a projected \$270,000 (Table 3K-4).

A projected \$19.3 million in annual direct and secondary income would be generated under the No-Project Alternative (Table 3K-6). This projected income level represents a net increase of \$12.6 million in regional income over the estimated existing level of income generated by use of the islands. The net increase in regional income under the No-Project Alternative is considered a beneficial economic effect.

## Fiscal Effects

Property values on the DW islands may increase as improvements are made to drainage systems and more land is brought into production, resulting in higher property tax revenue. Based on the increased agricultural production under the intensified use of the islands, property tax revenue could increase from approximately \$267,000 to \$715,000 under the No-Project Alternative.

Sales tax revenue may also increase relative to existing levels because of increased purchases of agricultural goods and services in the local area. Road maintenance costs also may rise with increased road wear caused by the transportation of agricultural products to and from the DW islands.

Public costs for levee maintenance and emergency repair would continue at existing levels or would increase because of further subsidence under the No-Project Alternative. Also, federal commodity crop deficiency pay-

ments may increase if crops produced under this alternative qualify for price supports.

Implementation of the No-Project Alternative would likely hasten erosion and subsidence problems associated with agricultural use of the project islands. This may ultimately reduce the fiscal benefits of the No-Project Alternative as agricultural production declines and levee maintenance and repair costs increase.

## **CUMULATIVE ECONOMIC EFFECTS OF THE ALTERNATIVES**

### **Effects on Agricultural Employment and Income**

Implementation of any of the DW project alternatives (except the No-Project Alternative) would contribute to the regional conversion of agricultural land. The DW project alternatives, in conjunction with other projects that convert agricultural land to other uses, would reduce employment and income for farmworkers and agriculture-dependent industries within the region.

As discussed in Chapter 3I, "Land Use and Agriculture", several projects in planning stages could convert agricultural lands to nonagricultural uses in the Delta region. These projects include DWR's North Delta and West Delta Programs and CCWD's Los Vaqueros Project. In addition, agricultural land conversions could occur through the development of new recreational uses on Delta islands and through additional habitat restoration and water storage projects on Delta islands encouraged by the DW project. The cumulative amount of agricultural land ultimately converted by related projects is not known but is expected to be relatively large.

Similar to the DW project alternatives, these projects would likely generate some employment and income from recreational uses and from project construction, operation, and maintenance activities. Employment and income in agricultural sectors, however, would be reduced by these projects.

The cumulative loss of agricultural land would result in the loss of substantial direct and secondary agricultural employment and the loss of income generated by agricultural production; however, current public expenditures on commodity crop deficiency payments could decline. The cumulative loss of agricultural employment and income is considered an adverse economic effect resulting from the cumulative conversion of agricultural land.

### **Effects on Recreation-Related Employment and Income**

As described in Chapter 3J, "Recreation and Visual Resources", a number of projects are being planned (mostly by public agencies) in the Delta that would involve management of wetland habitat. Many of these projects would presumably result in increased recreational opportunities for activities such as hunting, bird watching, and hiking. Although it is unknown whether hunting programs would be implemented on publicly acquired land in the Delta, regional hunter success on privately held land would be expected to increase as waterfowl are provided with better foraging in areas managed for wetland values.

Under all DW project alternatives, employment and income related to recreational use of the DW islands would increase. Enhanced recreational use of other private and public lands in the Delta would also lead to increased recreational spending in the region, generating increased regional employment and income. The cumulative effects on recreation generated by planned projects in conjunction with the DW project are expected to be beneficial because of the cumulative increase in recreational spending and related employment and income. The cumulative effects on recreation-related employment and income are therefore considered beneficial.

## **CITATIONS**

*References to the Code of Federal Regulations (CFR) are not included in this list. CFR citations in text refer to title and section (e.g., 40 CFR 1508.14 refers to Title 40 of the CFR, Section 1508.14).*

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Table 3K-1. Estimated Average Gross Value of Crops Grown on the DW Islands

Crops	Bacon Island			Webb Tract			Bouldin Island			Holland Tract*			All Islands		
	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value
Wheat				852 tons	113	96,276	3,189 tons	113	360,357	1,670 tons	113	188,710	5,711 tons	113	645,343
Corn (field)	3,280 tons	108	354,240	3,446 tons	108	372,168	11,366 tons	108	1,227,528	339 tons	108	36,612	18,431 tons	108	1,990,548
Sunflower	167 tons	400	66,800				770 tons	400	308,000				937 tons	400	374,800
Asparagus (fresh)	1,565 tons	1,288	2,015,720							603 tons	1,288	776,664	2,168 tons	1,288	2,792,384
Potato, Commercial	22,290 tons	198	4,413,420										22,290 tons	198	4,413,420
Seed	4,200 tons	204	856,800										4,200 tons	204	856,800
Wine grape (crushed)	1,904 tons	265	504,560										1,904 tons	265	504,560
Pasture				58 acres	96/acre	5,568	33 acres	96/acre	3,168	542 acres	96/acre	52,032	633 acres	96/acre	60,768
Total			8,211,540			474,012			1,899,053			1,054,018			11,638,623

\* Crop yield and production value includes production from 1,120 acres excluded from the project under Alternatives 1 and 2.

Notes: Prices and production values are shown in 1993 dollars.

Estimated total yields based on acreage planted in 1987. Refer to Chapter 31, "Land Use and Agriculture".

Prices represent 5-year (1988-1992) averages for San Joaquin County modified by information provided by farmers on the islands (Forkel pers. comm.).

Table 3K-2. Estimated Existing (1988) Employment and Income Generated in San Joaquin and Contra Costa Counties by Agricultural Use of the DW Islands

Crop	Multipliers*		Bacon Island			Webb Tract			Bouldin Island			Holland Tract <sup>b</sup>			All Islands		
			Existing Value of Production (\$1,000)	Income (\$1,000)	Employment (FTE)	Existing Value of Production (\$1,000)	Income (\$1,000)	Employment (FTE)	Existing Value of Production (\$1,000)	Income (\$1,000)	Employment (FTE)	Existing Value of Production (\$1,000)	Income (\$1,000)	Employment (FTE)	Existing Value of Production (\$1,000)	Income (\$1,000)	Employment (FTE)
	Income	Employment															
Wheat	0.4168	18.0				96.3	40.1	1.7	360.4	150.2	6.5	188.7	78.6	3.4	645.4	268.9	11.6
Corn	0.3983	17.1	354.2	141.1	6.1	372.2	148.2	6.4	1,227.5	488.9	21.0	36.6	14.6	0.6	1,990.5	792.8	34.1
Sunflower	0.4655	19.9	66.8	31.1	1.3				308.0	143.4	6.1				374.8	174.5	7.4
Asparagus	0.6353	27.6	2,015.7	1,280.6	55.6							776.7	493.4	21.4	2,792.4	1,774.0	77.0
Potato	0.6353	27.6	5,270.2	3,348.2	145.5										5,270.2	3,348.2	145.5
Wine grape	0.5936	25.6	504.6	299.5	12.9										504.6	299.5	12.9
Pasture	0.4655	19.9	—	—	—	—5.5	—2.6	—0.1	—3.2	—1.5	—0.1	—32.0	—24.2	—1.0	—60.8	—28.3	—1.2
Totals			8,211.5	5,100.5	221.4	474.0	190.9	8.2	1,899.1	784.0	33.7	1,054.0	610.8	26.4	11,638.7	6,686.2	289.7

Notes: Income and production values are shown in 1993 dollars.

Refer to Table 3K-1 for estimated average gross value of crops.

FTE = full-time equivalent.

\* Income multipliers represent the direct, indirect, and induced change in income resulting from each additional dollar of output delivered to final demand. Income includes employee compensation and proprietors' earnings, minus proprietor contributions to welfare and pension funds. Employment multipliers represent the direct, indirect, and induced change in the number of FTE jobs generated by each additional \$1 million of output delivered to final demand. (U.S. Bureau of Economic Analysis 1987.)

<sup>b</sup> Includes estimated production value, employment, and income generated by production of 1,120 acres excluded from the project under Alternatives 1 and 2.

Table 3K-3. Predicted Expenditures in San Joaquin and Contra Costa  
Counties by Recreationists Visiting the DW Project Islands

Project Alternative	Nonlocal Visitors to Site (visitor days per year) <sup>a</sup>	Visitor Expenditures (\$)						Total Spending by Island
		Eating and Drinking Places		Lodging Places		Retail Establishments		
		Spending per Day <sup>b</sup>	Total Spending	Spending per Day <sup>b</sup>	Total Spending	Spending per Day <sup>b</sup>	Total Spending	
<b>Existing Conditions (1988)</b>								
Bacon Island	2,576	\$7.99	\$20,582	\$5.32	\$13,704	\$17.74	\$45,698	\$79,984
Webb Tract	584	7.99	4,666	5.32	3,107	17.74	10,360	18,133
Bouldin Island	456	7.99	3,643	5.32	2,426	17.74	8,089	14,158
Holland Tract	<u>236</u>	7.99	<u>1,886</u>	5.32	<u>1,256</u>	17.74	<u>4,187</u>	<u>7,329</u>
Total	3,852		30,777		20,493		68,334	119,604
<b>Alternative 1</b>								
Bacon Island	34,326	5.84	200,464	0.00	0	18.94	650,134	850,598
Webb Tract	34,383	5.84	200,797	0.00	0	18.94	651,214	852,011
Bouldin Island	35,329	5.84	206,321	0.00	0	18.94	669,131	875,452
Holland Tract	<u>20,381</u>	5.84	<u>119,025</u>	0.00	<u>0</u>	18.94	<u>386,016</u>	<u>505,041</u>
Total	124,419		726,607		0		2,356,495	3,083,102
<b>Alternative 2</b>								
Bacon Island	34,353	5.84	200,622	0.00	0	18.94	650,646	851,268
Webb Tract	34,406	5.84	200,931	0.00	0	18.94	651,650	852,581
Bouldin Island	35,329	5.84	206,321	0.00	0	18.94	669,131	875,452
Holland Tract	<u>20,381</u>	5.84	<u>119,025</u>	0.00	<u>0</u>	18.94	<u>386,016</u>	<u>505,041</u>
Total	124,469		726,899		0		2,357,443	3,084,342
<b>Alternative 3</b>								
Bacon Island	34,351	5.84	200,610	0.00	0	18.94	650,608	851,218
Webb Tract	34,410	5.84	200,954	0.00	0	18.94	651,725	852,679
Bouldin Island	31,918	5.84	186,401	0.00	0	18.94	604,527	790,928
Holland Tract	<u>24,993</u>	5.84	<u>145,959</u>	0.00	<u>0</u>	18.94	<u>473,367</u>	<u>619,326</u>
Total	125,672		733,924		0		2,380,227	3,114,151

Table 3K-3. Continued

Project Alternative	Nonlocal Visitors to Site (visitor days per year) <sup>a</sup>	Visitor Expenditures (\$)						Total Spending by Island
		Eating and Drinking Places		Lodging Places		Retail Establishments		
		Spending per Day <sup>b</sup>	Total Spending	Spending per Day <sup>b</sup>	Total Spending	Spending per Day <sup>b</sup>	Total Spending	
<b>No-Project Alternative</b>								
Bacon Island	5,219	10.77	56,209	3.15	16,440	22.64	118,158	190,807
Webb Tract	2,769	10.77	29,822	3.15	8,722	22.64	62,690	101,234
Bouldin Island	3,234	10.77	34,830	3.15	10,187	22.64	73,218	118,235
Holland Tract	2,233	10.77	24,049	3.15	7,034	22.64	50,555	81,638
Total	13,455		144,910		42,383		304,621	491,914

Notes: Expenditures are in 1993 dollars.

<sup>a</sup> See Table 3J-8. Excludes the visitor days of residents of the two-county area (20% of total recreation user days) for all alternatives and existing conditions. Local recreationists visit and spend in the local area, but these expenditures do not result in changes in final demand for services in the two-county area. Recreation user days include days spent hunting, boating, and participating in other recreation activities.

<sup>b</sup> Spending-per-day estimates are based on studies of daily spending by recreationists in California (USFWS and U.S. Bureau of the Census 1993) and nationwide (Propst et al. 1992), updated to 1993 dollars and revised for application to the industrial classes in this table. These spending estimates represent average expenditures per visitor day. Because not all recreationists would use lodging places during a trip, the estimated average daily expenditures for lodging represent only a portion of the daily cost of a lodging place and therefore are lower than may be expected. Visitors to the DW project islands are assumed to use onsite lodging facilities under Alternatives 1, 2, and 3.

Table 3K-4. Projected Income and Employment Generated in San Joaquin and Contra Costa Counties by Recreational Use of the Islands under the DW Project Alternatives

Expenditure Type	Multipliers <sup>a</sup>		Bacon Island			Webb Tract			Bouldin Island			Holland Tract			All Islands		
	Income	Employment	Projected Spending (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Spending (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Spending (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Spending (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Spending (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)
<b>Existing Conditions (1988)</b>																	
Eating and drinking places	0.4526	35.1	20.6	9.3	0.7	4.7	2.1	0.2	3.6	1.6	0.1	1.9	0.9	0.1	30.8	13.9	1.1
Lodging	0.5000	37.7	13.7	6.9	0.5	3.1	1.6	0.1	2.4	1.2	0.1	1.2	0.6	0.1	20.4	10.3	0.8
Retail purchases	0.6427	28.0	43.7	22.4	1.3	10.4	6.7	0.3	8.1	2.2	0.2	4.2	2.7	0.1	68.4	44.0	1.2
Total			80.0	45.6	2.5	18.2	10.4	0.6	14.1	8.0	0.4	7.3	4.2	0.3	119.6	68.2	3.8
<b>Alternative 1</b>																	
Eating and drinking places	0.4526	35.1	200.5	90.7	7.0	200.8	90.9	7.0	206.3	93.4	7.2	119.0	53.9	4.2	726.6	328.9	25.4
Lodging	0.5000	37.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail purchases	0.6427	28.0	650.1	412.8	18.2	651.2	418.3	18.2	669.1	430.0	18.7	386.0	248.1	10.8	2,356.4	1,514.4	63.9
Total			850.6	508.5	25.2	852.0	509.4	25.2	875.4	523.4	25.9	505.0	302.0	15.0	3,083.0	1,843.3	91.3
<b>Alternative 2</b>																	
Eating and drinking places	0.4526	35.1	200.6	90.8	7.0	200.9	90.9	7.1	206.3	93.4	7.2	119.0	53.9	4.2	726.8	329.0	25.5
Lodging	0.5000	37.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail purchases	0.6427	28.0	650.7	418.2	18.2	651.7	418.8	18.2	669.1	430.0	18.7	386.0	248.1	10.8	2,357.5	1,515.1	63.9
Total			851.3	509.0	25.2	852.6	509.7	25.3	875.4	523.4	25.9	505.0	302.0	15.0	3,084.3	1,844.1	91.4
<b>Alternative 3</b>																	
Eating and drinking places	0.4526	35.1	200.6	90.8	7.0	200.9	90.9	7.1	186.4	84.4	6.5	145.9	66.0	5.1	733.8	332.1	25.7
Lodging	0.5000	37.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail purchases	0.6427	28.0	650.6	418.1	18.2	651.7	418.8	18.2	604.3	388.5	16.9	473.4	304.3	13.3	2,380.2	1,529.7	66.6
Total			851.2	508.9	25.2	852.6	509.7	25.3	790.9	472.9	23.4	619.3	370.3	18.4	3,114.0	1,861.8	92.3
<b>No-Project Alternative</b>																	
Eating and drinking places	0.4526	35.1	56.2	25.4	2.0	29.8	13.5	1.0	34.8	15.7	1.2	24.0	10.9	0.8	144.8	65.5	5.0
Lodging	0.5000	37.7	16.4	1.6	0.6	8.7	4.4	0.3	10.2	1.7	0.4	7.0	1.2	0.3	42.3	8.9	1.6
Retail purchases	0.6427	28.0	118.2	76.0	3.3	62.7	40.3	1.8	73.2	47.0	2.0	50.8	32.3	1.4	304.7	192.8	8.2
Total			190.8	103.0	5.9	101.2	58.2	3.1	118.2	64.4	3.6	81.6	44.6	2.5	491.8	270.2	15.1

Note: Income and spending are shown in 1993 dollars.

FTE = full-time equivalent.

<sup>a</sup> Income multipliers represent the direct, indirect, and induced change in income resulting from each additional dollar of output delivered to final demand (net spending). Income includes employee compensation and proprietors' earnings, minus proprietor contributions to welfare and pension funds. Employment multipliers represent the direct, indirect, and induced change in the number of FTE jobs generated by each additional \$1 million of output delivered to final demand (net spending).

<sup>b</sup> Represents spending by nonlocal visitors to the islands. See Table 3K-3.

Table 3K-5. Comparison of Employment Estimated to Be Generated under the DW Project Alternatives (FTE)

Employment Generator	1988 Existing Conditions					Alternatives 1 and 2 <sup>a</sup>					Alternative 3 <sup>a</sup>					No-Project Alternative				
	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands
<b>Annual Employment</b>																				
Agriculture	221	8	34	26	289	0	0	0	9	9	0	0	0	0	0	368	33	391	36	828
Recreation	3	1	0	0	4	25	25	26	15	91	25	25	24	18	92	6	3	4	2	15
Operations and maintenance <sup>b</sup>	0	0	0	0	0	95	89	63	68	315	95	89	80	87	351	0	0	0	0	0
Total annual employment	224	9	34	26	293	120	114	89	92	415	120	114	104	105	443	374	36	395	38	843
<b>Temporary Employment</b>																				
Water project construction <sup>c</sup>	0	0	0	0	0	134	121	74	15	344	134	121	368	109	732	0	0	0	0	0
Recreation facilities construction <sup>d</sup>	0	0	0	0	0	10	10	10	7	37	10	8	8	10	36	0	0	0	0	0

Notes: Employment figures represent the number of annual FTE direct and secondary jobs generated within San Joaquin and Contra Costa Counties. Estimates and projections are based on employment multipliers from the Regional Input-Output Modeling System (U.S. Bureau of Economic Analysis 1987).

<sup>a</sup> Agricultural employment includes estimated employment generated by production of 1,120 acres on Holland Tract excluded from the project under Alternatives 1 and 2, but included in the project under Alternative 3.

<sup>b</sup> Represents direct and secondary employment generated by the operation and maintenance of water and recreation facilities. These employment estimates represent the number of FTE direct and secondary jobs generated by operation and maintenance of facilities located on the DW project islands; these employment totals do not necessarily represent the number of persons who would actually be hired to work on the islands and within the region.

<sup>c</sup> Represents direct and secondary FTE employment generated per year by construction of water project facilities. Employment generated by the construction of water facilities is expected to last 1.5 years (2.5 years for construction of facilities on Bouldin Island under Alternative 3).

<sup>d</sup> Represents direct and secondary FTE employment generated per year by construction of recreation facilities. Employment generated by construction of recreation facilities is expected to last 20 years.

Table 3K-6. Comparison of Income Estimated to Be Generated under the DW Project Alternatives (\$1,000)

Employment Generator	1988 Existing Conditions					Alternatives 1 and 2 <sup>a</sup>					Alternative 3 <sup>a</sup>					No-Project Alternative				
	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands	Bacon Island	Webb Tract	Bouldin Island	Holland Tract	All Islands
<b>Annual Income</b>																				
Agriculture	5,100.5	190.9	784.0	610.8	6,686.2	0.0	0.0	0.0	217.6	217.6	0.0	0.0	0.0	0.0	0.0	8,475.3	769.4	9,010.3	838.7	19,093.7
Recreation	45.6	10.4	8.0	4.2	68.2	508.5	509.4	523.4	302.0	1,843.3	508.9	509.7	472.9	370.3	1,861.8	103.0	58.2	64.4	44.6	270.2
Operations and maintenance <sup>b</sup>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>3,446.8</u>	<u>3,229.1</u>	<u>2,285.8</u>	<u>2,467.2</u>	<u>11,428.9</u>	<u>3,446.8</u>	<u>3,229.1</u>	<u>2,902.6</u>	<u>3,156.5</u>	<u>12,735.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total annual income	5,146.1	201.3	792.0	615.0	6,754.4	3,955.3	3,738.5	2,809.2	2,986.8	13,489.8	3,955.7	3,738.8	3,375.5	3,526.8	14,596.8	8,578.3	827.6	9,074.7	883.3	19,363.9
<b>Temporary Income</b>																				
Water project construction <sup>c</sup>	0.0	0.0	0.0	0.0	0.0	5,549.9	5,011.5	3,064.9	621.2	14,247.5	5,549.9	5,011.5	15,241.5	4,514.4	30,317.3	0.0	0.0	0.0	0.0	0.0
Recreation facilities construction <sup>d</sup>	0.0	0.0	0.0	0.0	0.0	414.2	414.2	414.2	289.9	1,532.5	414.2	331.3	331.3	414.2	1,491.0	0.0	0.0	0.0	0.0	0.0

Notes: Income is shown in thousands of 1993 dollars.

Income figures represent the annual direct and secondary income generated within San Joaquin and Contra Costa Counties.

Estimates and projections are based on income multipliers from the Regional Input-Output Modeling System (U.S. Bureau of Economic Analysis 1987).

<sup>a</sup> Income generated by recreation would be slightly higher under Alternative 2 than under Alternative 1. Agricultural income includes estimated income generated by production of 1,120 acres on Holland Tract excluded from the project under Alternatives 1 and 2, but included in the project under Alternative 3.

<sup>b</sup> Represents direct and secondary income generated by the operation and maintenance of water and recreation facilities.

<sup>c</sup> Represents direct and secondary income generated per year during the construction of water project facilities. Construction of water facilities is expected to require 1.5 years (2.5 years for construction of facilities on Bouldin Island under Alternative 3).

<sup>d</sup> Represents direct and secondary income generated per year during the construction of recreation facilities. Construction of all recreation facilities is expected to last 20 years.



Table 3K-7. Projected Average Gross Value of Crops Grown on the DW Islands under the No-Project Alternative

Crop	Bacon Island			Webb Tract			Bouldin Island			Holland Tract			All Islands		
	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value	Total Yield	Price per Unit	Total Gross Value
Wheat				4,368 tons	113	493,584				3,948 tons	113	446,124	8,316 tons	113	939,708
Corn (field)				13,040 tons	108	1,408,320				3,200 tons	108	345,600	16,240 tons	108	1,753,920
Onion	14,400 tons	182	2,620,800				15,120 tons	182	2,751,840				29,520 tons	182	5,372,640
Asparagus (fresh)	2,475 tons	1,288	3,187,800				2,595 tons	1,288	3,342,360	600 tons	1,288	772,800	5,670 tons	1,288	7,302,960
Potato															
Commercial	31,350 tons	198	6,207,300				38,400 tons	198	7,603,200				69,750 tons	198	13,810,500
Seed	4,200 tons	204	856,800										4,200 tons	204	856,800
Wine grape (crushed)	1,890 tons	265	500,850				1,960 tons	265	519,400	3,710 tons			7,560 tons	135	1,020,250
Pasture				60 acres	\$96/acre	5,760				540 acres	\$96/acre	51,840	600 acres	\$96/acre	57,600
Total			13,373,550			1,907,664			14,216,800			1,616,364			31,114,378

Notes: Gross values are shown in 1993 dollars.

Projected total yields are based on assumptions for cropping under intensified agriculture under the No-Project Alternative. Refer to Chapter 3I, "Land Use and Agriculture".

Prices represent 5-year (1988-1992) averages for San Joaquin County, modified by information provided by farmers on the DW islands (Forkel pers. comm.).

Table 3K-8. Projected Income and Employment Generated in San Joaquin and Contra Costa Counties by Agricultural Use of the DW Islands under the No-Project Alternative

Crops	Multipliers <sup>a</sup>		Bacon Island			Webb Tract			Bouldin Island			Holland Tract			All Islands		
			Projected Value of Production (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Value of Production (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Value of Production (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Value of Production (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)	Projected Value of Production (\$1,000) <sup>b</sup>	Income (\$1,000)	Employment (FTE)
	Income	Employment															
Wheat	\$0.4168	18.0				\$493.6	\$205.7	8.9				\$446.1	\$185.9	8.0	\$939.7	\$391.7	16.9
Corn	0.3983	17.1				1,408.3	560.9	24.1				345.6	137.7	5.9	1,753.9	698.6	30.0
Onions	0.6353	27.6	\$2,620.8	\$1,665.0	72.3				\$2,751.8	\$1,748.2	75.9				5,372.6	3,413.2	148.3
Asparagus	0.6353	27.6	3,187.8	2,025.2	88.0				3,342.4	2,123.4	92.3	772.8	491.0	21.3	7,303.0	4,639.6	201.6
Potatoes	0.6353	27.6	7,064.1	4,487.8	195.0				7,603.2	4,830.3	209.8				14,667.3	9,318.1	404.8
Wine grapes	0.5936	25.6	500.8	297.3	12.8				519.4	308.3	13.3				1,020.2	605.6	26.1
Pasture	0.4655	19.9				5.8	2.7	0.1				51.8	24.1	1.0	57.6	26.8	1.1
Total			\$13,373.5	\$8,475.3	368.1	\$1,907.7	\$769.4	33.1	\$14,216.8	\$9,010.3	391.3	\$1,616.3	\$838.7	36.3	\$31,114.3	\$19,093.6	828.8

Notes: Income and production values are shown in 1993 dollars.

FTE = full-time equivalent.

<sup>a</sup> Income multipliers represent the direct, indirect, and induced change in income resulting from each additional dollar of output delivered to final demand. Income includes employee compensation and proprietors' earnings, minus proprietor contributions to welfare and pension funds. Employment multipliers represent the direct, indirect, and induced change in the number of FTE generated by each additional \$1 million of output delivered to final demand. (U.S. Bureau of Economic Analysis 1987.)

<sup>b</sup> Refer to Table 3K-7 for projected average gross value of crops.